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10/666,518	09/19/2003	Mitsuru Mimori	5405-8	9176

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EXAMINER	
PATEL, GAUTAM	
ART UNIT	**PAPER NUMBER**
2627	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/666,518	MIMORI ET AL.	
	Examiner	Art Unit	
	Gautam R. Patel	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 8/6/07 are pending for the examination.

RCE STATUS

2. The request filed on 7/23/07 for Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 U.S.C. § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-14, 16-18, 20-34, 36-39, 41-44, as best understood, are rejected under 35 U.S.C. § 102(e) as being anticipated by Ota et al., US. patent 6,687,209 (hereafter Ota).

As to claim 1, Ota discloses the invention as claimed, an optical element [see Figs. 1-6,] including a diffractive structure, and ring-shaped zones, comprising:

a diffractive structure [fig. 1 and 6, surface 11, 12, 13] having a plurality of diffracting ring-shaped zones arranged around an optical axis on at least one optical surface; and

an optical path difference giving structure [fig. 1, unit 13a] arranged on an optical surface of at least one of the plurality of diffracting ring-shaped zones, for giving a prescribed optical path difference to a prescribed light beam passing through the diffracting ring-shaped zone,

wherein the diffractive structure is a structure having a diffracting function for setting L-th ($L \neq 0$) order diffracted light of the light beam having the first wavelength λ_1 to a maximum diffraction efficiency and for setting M-th ($M \neq 0$) order diffracted light of the light beam having the second wavelength $\lambda 2$ to a maximum diffraction efficiency if the optical path difference giving structure does not exist on the optical surface of the diffractive structure [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

4. The aforementioned claim 2, recites the following elements, inter alia, disclosed in Ota:

as compared with the diffractive structure when the optical path difference giving structure is not provided on the optical surface of the diffractive structure, the optical path difference giving structure lowers an absolute value of an optical phase difference between the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$ by changing a phase of at least one of the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$, the L-th order diffracted light and the M-th order diffracted light being caused by the structure having the diffracting function [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

5. The aforementioned claim 3, recites the following elements, inter alia, disclosed in Ota:

as compared with the diffractive structure when the optical path difference giving structure is not provided on the optical surface of the diffractive structure, the optical path difference giving structure lowers an absolute value of an optical phase difference between the L-th order diffracted light of the light beam having the first wavelength $\lambda_1$and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$ by substantially giving no change of a phase of one of the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$ and by giving a phase difference to the other of the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light having the light beam having the second wavelength $\lambda 2$, the L-th order diffracted light and the M-th order diffracted light being caused by the structure having the diffracting function [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

6. The aforementioned claim 4, recites the following elements, inter alia, disclosed in Ota:

as compared with the diffractive structure when the optical path difference giving structure is not provided on the optical surface of the diffractive structure, the optical path difference giving structure lowers an absolute value of an optical phase difference between the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$ by giving a phase difference to both the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$, the L-th order diffracted light and the M-th order diffracted light being caused by the structure having the diffracting function [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

7. The aforementioned claim 5, recites the following elements, inter alia, disclosed in Ota:

as compared with the diffractive structure when the optical path difference giving structure is not provided on the optical surface of the diffractive structure, the optical path difference giving structure lowers an absolute value of an optical phase difference between the L-th order diffracted light of the light beam having the first wavelength λ_1 and the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$ by giving an optical path difference approximately equal to an integral multiple having the first wavelength λ_1 to the L-th order diffracted light of the light beam having the first wavelength λ_1 to substantially give no change of a phase difference generated by the diffractive structure and by giving an optical path difference not equal to an integral multiple having the second wavelength $\lambda 2$ to the M-th order diffracted light of the light beam having the second wavelength $\lambda 2$ [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

8. The aforementioned claim 6, recites the following elements, inter alia, disclosed in Ota:

the optical path difference giving structure sets the absolute value of the optical phase difference to a value lower than 0.6.pi. radians [fig. 9] [col. 22, line 66 to col. 23, line 42].

9. The aforementioned claim 7, recites the following elements, inter alia, disclosed in Ota:

the structure having the diffracting function has a discontinuous surface formed in a serrate shape, and the optical path difference giving structure has a discontinuous surface formed in a stepped shape along a direction of the optical axis [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

10. The aforementioned claim 8, recites the following elements, inter alia, disclosed in Ota:

the structure having the diffracting function has a discontinuous surface formed in a stepped shape along a direction of the optical axis, and the optical path difference giving structure has a discontinuous surface formed in a stepped shape along the direction of the optical axis [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

11. The aforementioned claim 9, recites the following elements, inter alia, disclosed in Ota:

the optical surface comprises a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region arranged at a periphery of the central region, the structure having the diffracting function and the optical path difference giving structure are provided in the central region, and the diffractive structure formed in a serrate shape is provided in the peripheral region [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

12. The aforementioned claim 10, recites the following elements, inter alia, disclosed in Ota:

the optical surface comprises a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region arranged at a periphery of the central region, the structure having the diffracting function and the optical path difference giving structure are provided in the central region, and the optical path difference giving structure is provided in the peripheral region [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

13. The aforementioned claim 11, recites the following elements, inter alia, disclosed in Ota:

the optical surface comprises a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region arranged at a periphery of the central region, the structure having the diffracting function and the optical path difference giving structure are provided in the central region, and a refractive structure for refracting a light beam is arranged in the peripheral region [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

14. The aforementioned claim 12, recites the following elements, inter alia, disclosed in Ota:

L=M is satisfied [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

NOTE: Equal steps satisfies L=M.

15. The aforementioned claim 13, recites the following elements, inter alia, disclosed in Ota:

L=M=1 is satisfied [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

16. The aforementioned claim 14, recites the following elements, inter alia, disclosed in Ota:

the number of the discontinuous surfaces, which are formed in a stepped shape along a direction of the optical axis and composes the optical path difference giving structure, is 2 or 3 [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

17. The aforementioned claim 16, recites the following elements, inter alia, disclosed in Ota:

the structure having the diffracting function sets a sum of a diffraction efficiency of the L-th order diffracted light of the light beam having the first wavelength λ_1 and a diffraction efficiency of the M-th order diffracted light of the light beam having the second wavelength λ_2 to 170% or less, and the optical path difference giving structure heightens the sum of the diffraction efficiency of the L-th order diffracted light of the light beam having the first wavelength λ_1 and the diffraction efficiency of the M-th order diffracted light of the light beam

having the second wavelength λ_2 by 10% or more [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

18. The aforementioned claims 17, 33 & 43, recites the following elements, inter alia, disclosed in Ota:

the light beam having the first wavelength λ_1 and the light beam having the second wavelength λ_2 are respectively incident on the optical surface as a diverging light beam, and the light beam having the first wavelength λ_1 and the light beam having the second wavelength λ_2 are converged on a prescribed optical information recording medium in a condition that spherical aberration and/or wave front aberration are corrected [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

19. The aforementioned claims 18, 34 & 44, recites the following elements, inter alia, disclosed in Ota:

a magnification m satisfies a formula:-0.295 <= m <= -0.049 [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

20. The aforementioned claims 20 & 41, recites the following elements, inter alia, disclosed in Ota:

the first wavelength λ_1 and the second wavelength λ_2 are a use reference wavelength corrected [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

21. The aforementioned claim 21, recites the following elements, inter alia, disclosed in Ota:

the optical path difference giving structure gives an optical path difference to the diffracted light so that a -N-th order diffracted light of the light beam having the use reference wavelength λ_1 has a maximum diffraction efficiency and so that a (-N+1)-th order diffracted light of the light beam having the use reference wavelength λ_2 or a (-N-1)-th order diffracted light of the light beam having the use reference wavelength λ_2 has a maximum diffraction

efficiency [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

22. The aforementioned claim 22, recites the following elements, inter alia, disclosed in Ota: the optical surface of the diffracting ring-shaped zone has a structure substantially inclined with respect to the optical surface formed in a prescribed aspherical shape, the structure substantially inclined having a discontinuous surface formed in a serrate shape, and the optical path difference giving structure has a discontinuous surface formed in a stepped shape along the direction of the optical axis [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

23. The aforementioned claim 23, recites the following elements, inter alia, disclosed in Ota: the optical surface of the diffracting ring-shaped zone has a structure substantially inclined with respect to the optical surface formed in a prescribed aspherical shape, the structure substantially inclined having a discontinuous surface formed in a stepped shape along the direction of the optical axis, and the optical path difference giving structure has a discontinuous surface formed in a stepped shape along the direction of the optical [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

24. The aforementioned claim 24, recites the following elements, inter alia, disclosed in Ota: the optical surface formed in the prescribed aspherical shape is partitioned into a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region surrounding a periphery of the central region, the diffracting ring-shaped zones are arranged in the central region, and a diffracting ring-shaped zone formed in the serrate shape is arranged in the peripheral region [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

25. The aforementioned claim 25, recites the following elements, inter alia, disclosed in Ota:

the optical surface formed in the prescribed aspherical shape is partitioned into a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region surrounding a periphery of the central region, the diffracting ring-shaped zones are arranged in the central region, and the optical path difference giving structure is arranged in the peripheral region [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

26. The aforementioned claim 26, recites the following elements, inter alia, disclosed in Ota:

the optical surface formed in the prescribed aspherical shape is partitioned into a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region surrounding a periphery of the central region, the diffracting ring-shaped zones are arranged in the central region, and a refractive structure for reflecting the light beam is arranged in the peripheral region [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

27. The aforementioned claim 27, recites the following elements, inter alia, disclosed in Ota:

the number of diffracting ring-shaped zones is from 3 to 20 [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

28. The aforementioned claim 28, recites the following elements, inter alia, disclosed in Ota:

the optical path difference giving structure gives an optical path difference equal to an integral multiple of the use reference wavelength λ_2 to the light beam having the use reference wavelength λ_2 [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

29. The aforementioned claim 29, recites the following elements, inter alia, disclosed in Ota:

wherein L=M is satisfied [see fig. 34; & col. 17, line 11 to col. 18, line 15; surfaces 1A & 1B].

NOTE: Equal steps satisfies L=M.

30. The aforementioned claim 30, recites the following elements, inter alia, disclosed in Ota: L=N is satisfied.

31. The aforementioned claim 31, recites the following elements, inter alia, disclosed in Ota: wherein M=N is satisfied. [see fig. 34; & col. 17, line 11 to col. 18, line 15; surfaces 1A & 1B].

32. The aforementioned claim 32, recites the following elements, inter alia, disclosed in Ota: L=M=N is satisfied. [see fig. 34; & col. 17, line 11 to col. 18, line 15; surfaces 1A & 1B].

33. As to claim 36, it is rejected for the similar reasons set forth in the rejection of claim 1, supra. As to the added limitation of plurality of optical elements [see fig. bnm].

34. As to claim 37, it is rejected for the similar reasons set forth in the rejection of claim 2, supra.

35. The aforementioned claim 38, recites the following elements, inter alia, disclosed in Ota: one of the optical elements is an objective optical element [objective lens] , and the light beam having the first wavelength λ_1 and the light beam having the second wavelength λ_2 are respectively incident on the objective optical element as a diverging light beam, and the light beam having the first wavelength λ_1 and the light beam having the second wavelength λ_2 are converged on a prescribed optical information recording medium in a condition that spherical aberration and/or wave front aberration are corrected [col. 8, line 66 to col. 9, line 51; col. 16, line 53 to col. 18, line 15; figs. 32-34].

Claim Rejections - 35 U.S.C. § 103

36. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 15, 19, 35, 40 and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ota as applied to claims 1-14, 16-18, 20-34, 36-39, 41-44 above.

Regarding claim 15, although Ota does not specifically disclose that the first wavelength λ_1 satisfies 370 nm.<= λ_1 <= 430 nm. Ota does teach that one of the wavelength [second wavelength] is 655 +- 30 nm. Ota teaches that his diffractive element is useful for DVD and CD. Even thought Ota does not discloses use of blue laser wavelength of 370 to 430 nm, these are well known in the art for long time.

The limitations in claim 15 do not define a patentable distinct invention over that in Ota since both the invention as a whole and Ota are directed to using a diffractive element for use with two different wavelength lasers. The use of higher wavelength presents no new or unexpected results, so long as the diffractive element with step function which is an optical path giving structure and allows read/write on high density disc and also CD disc in a successful way. If one has less density requirement one use lower wavelength and one needs more density one use higher wavelength . Therefore, to have exactly wavelength between 370 and 430 nm would have been routine experimentation and optimization in the absence of criticality. And also this would be the logical steps in the evolution of the DVD art.

37. Regarding claims 19 & 35, although Ota does not specifically disclose that the a curvature radii R1 & R2 satisfies -3.2<R2/R1<-1.9 to the extent claimed.

Ota teaches different radii for different regions and sides . The limitations in claim 10 do not define a patentable distinct invention over that in Ota since both the invention as a whole and Ota are directed to removing aberrations in CD and DVD and use single structure to read CD and DVD with a single system in the optical pickup. The degree in which the ration R2/R1 is defined presents no new or unexpected results, so long as the optical pickup can read CD and DVD with minimum aberration. Therefore, to have the ratio satisfy 3.2<R2/R1<-1.9 with respect to diffraction element in an optical pickup would have been routine experimentation and optimization in the absence of criticality.

38. As to claims 40 & 45, Ota teaches multiple light sources. Ota does not specifically teach a third light source for third thickness. "Official Notice" is taken that both the concept and the advantages of providing a third light source are well known and expected in the art. It would have been obvious to include third light source to Ota as this extra light source is are known to provide higher usefulness in the same system and thereby saving time and money while trying to read disc of third thickness type. These concepts are well known in the art and do not constitute a patentably distinct limitation, per se [M.P.E.P. 2144.03].

Contact information

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gautam R. Patel whose telephone number is 571-272-7625. The examiner can normally be reached on Monday through Thursday from 7:30 to 6.

The appropriate fax number for the organization (Group 2600) where this application or proceeding is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Dwayne Bost, who can be reached on (571) 272-7023.

Any inquiry of a general nature or relating to the status of this application should be directed to the Electronic Business Center whose telephone number is 866-217-9197 or the USPTO contact Center telephone number is (800) PTO-9199.

GAUTAM R. PATEL
PRIMARY PATENT EXAMINER

Gautam R. Patel
Primary Examiner
Group Art Unit 2627

August 21, 2007